

Message From the Chief Editor

Dear Reader,

Welcome to the issue of the *Journal of Research of the National Institute of Standards and Technology* that commemorates the Centennial of a truly unique and remarkable institution!

The National Institute of Standards and Technology (NIST) was founded as the National Bureau of Standards (NBS) on March 3, 1901 by the 56th Congress of the United States (Public Law 177). Thus March 3, 2001 is NIST's 100th birthday. In honor of this historic occasion, the January–February 2001 issue of the *Journal* (Volume 106, Number 1) is published as the Centennial Issue with the title "NBS/NIST—100 Years of Measurement."

NBS became NIST on August 23, 1988, when President Reagan signed the Omnibus Trade and Competitiveness Act. Although NIST was founded as NBS in 1901, when NBS was Transferred in 1903 from the Treasury Department, its initial home, to the new Department of Commerce and Labor, the word "National" was eliminated from the name by the head of the Department because it was thought that the word "National" was inconsistent with the names of similar bureaus in the Department. In 1934, some 30 years later, the original NBS name was restored because of the proliferation of "Bureaus of Standards" in State governments and private organizations.

Since its founding in 1901, NIST has served as the Nation's national metrology institute (NMI). As such, metrology, which is the science that deals with measurement, has been the foundation upon which the entire institution has rested for its first 100 years of existence. The title of this Centennial Issue, "NBS/NIST—100 Years of Measurement," and the topics covered by the articles it contains, were chosen to reflect its century-old, core measurement mission. (In the present context, we interpret "measurement" to include, measurement, standards, and data.)

But I should hasten to add that NIST does not exist to pursue metrology for its own sake. Rather, its purpose is to provide the measurement infrastructure for U.S. industry, scientific institutions, universities and colleges, and other organizations so that they can function both efficiently and effectively. Simply put, measurement plays an essential and crucial role in science and technology and in trade and commerce. Scientific theories cannot be tested, instruments and machines cannot be designed and built, and the daily routine of the local, national, and global market places cannot proceed without precise measurement.

In soliciting contributions to the Centennial Issue from the NIST staff, I took into account the fact that metrology requires a system of units in terms of which measurement results can be expressed. Since the dominant system in use in science as well as in international commerce is the modern metric system known as the International System of Units (universally abbreviated SI from the French name *Système International d'Unités*), the first six articles revolve around six of the seven base units of the SI: the meter, kilogram, second, ampere, kelvin, and candela, which are the units for length, mass, time, electric current, thermodynamic temperature, and luminous intensity, respectively. I also took into account the fact that not all of NIST's work can be neatly categorized by SI base units and the measurements associated with them. Thus, a number of articles covering other topics are included. However, as the reader will quickly see, the common thread of these articles is also measurement. This should come as no surprise since, as I have emphasized above, NIST's *raison d'être* is metrology.

You will note that the 12 articles in this Centennial Issue vary in form, level of detail, and length. With that old saw “variety is the spice of life” in mind, and recognizing that detailed instructions can be inhibiting, I gave the author(s) of each article wide latitude in deciding the article’s exact content and length. I simply said that the principal focus of each article should be NIST’s current work (i.e., measurement capabilities, methods, and research) in the field covered by the article, but each article should have

- (1) a brief historical introduction that discussed the pivotal developments in the field since NBS/NIST was founded in 1901 and NIST’s role in those developments; and
- (2) a concluding section that looks to the future: What new developments in the field are most likely to occur in the first decade of the new millennium and what role will NIST likely play in those developments?

I believe that most authors followed this guidance. In any event, I hope that you find this Centennial Issue both enlightening and enjoyable, and that my distant successor late in the 21st century finds it good enough to show to the authors writing articles for the Bicentennial Issue of the *Journal* celebrating the 200th birthday of NIST and say to them “It is a good model to follow.”

Barry N. Taylor
Chief Editor